IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Applicant:	ABBOTT, Nicholas L.
Application No.:	10/711,517
Filing Date:	September 23, 2004
Title:	USING LIQUID CRYSTALS TO DETECT AFFINITY MICOCONTACT PRINTED BIOMOLECULES
Atty Docket No.:	960296.00526
Examiner:	FOSTER, Christine E.
Group Art Unit:	1641

DECLARATION UNDER RULE 1.132

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

1. I, Nicholas L. Abbott, the undersigned declare as follows:

2. All statements made herein are true to the best of my knowledge, or if made upon information and belief are believed to be true.

3. I received a Ph.D. in Chemical Engineering from Massachusetts Institute of Technology and performed my post-Doctoral work at Harvard University in the Department of Chemistry. I have been a professor of Chemical and Biological Engineering at the University of Wisconsin-Madison since 1998. My areas of research interest include liquid crystal technology, interfacial phenomena, colloid chemistry, nano-scale science and polymers. I have over 150 peer reviewed publications in these fields.

4. I am a co-inventor of the above captioned patent application. Accordingly, I am completely familiar with the subject matter of this patent application including the claims. I have also reviewed the latest Office Action mailed April 10, 2007 and have read the various

objections/rejections described therein. I am providing this declaration to address the obviousness rejection raised by the U.S. Patent and Trademark Office.

5. The Office is correct in noting that my issued US patent 6,852, 285 B2 does make reference to microcontact printing. Column 7 of the patent reads:

> The substrate can also be patterned using techniques such as photolithography (Kleinfield et al., *J. Neurosci.* 8:4098–120 (1998)), photoetching, chemical etching and microcontact printing (Kumar et al., *Langmuir* 10: 1498–511 (1994)). Other techniques for forming patterns on a substrate will be readily apparent to those of skill in the art.
>
> The size and complexity of the pattern on the substrate is limited only by the resolution of the technique utilized and the purpose for which the pattern is intended. For example, using microcontact printing, features as small as 200 nm have been layered onto a substrate. See, Xia, Y.; Whitesides, G., *J. Am. Chem. Soc.* 117:3274–75 (1995). Similarly, using photolithography, patterns with features as small as 1 μm have been produced. See, Hickman et al., *J. Vac. Sci. Technol.* 12:607–16(1994). Patterns which are useful in the present invention include those which comprise features such as wells, enclosures, partitions, recesses, inlets, outlets, channels, troughs, diffraction gratings and the like.

6. The above text (column 17) is part of a description of materials and methods that can be used to fabricate surfaces (referred to as "substrates" in the patent) on which molecular interactions can be detected using liquid crystals. In support of this comment, I note that column 17 is part of a section of text that starts in column 14, and is labeled "A. Substrates". This section of text describes various materials that can be used to fabricate surfaces, including inorganic crystals, and glasses and inorganic oxides, metals, and organic polymers. In this context, text in column 17 notes that various means can be used to process these materials, including photolithography, photoetching, chemical etching and microcontact printing. In preparing this text, we made reference to Kumar et al (Langmuir, 10, 1498-1511, 1994) and Xia and Whitesides (JACS, 117, 3274-75, 1995). These two papers accurately describe the use of microcontact printing (but not affinity microcontact printing) as a tool for microfabrication of structured surfaces, including gold and silicon micro and nanostructures. In particular, these papers point out that microcontact printing permits fabrication of structures as small as 200nm, which is reiterated in column 17 of the application. Whereas the column 17 text and the above references clearly describe microcontact printing as a tool for fabrication of surfaces, neither the

column 17 text nor the above references suggest that microcontact printing can be used to deliver analytes to a surface for detection of molecular interactions using liquid crystal. It is this use of "affinity" microcontact printing (i.e., a means of delivery of an analyte to a surface) that is described and claimed in my present patent application. As well, my present patent application does not mention the use of affinity microcontact printing as a tool for microfabrication of device surfaces.

7. This declaration is made with knowledge that willful false statements and the like are punishable by fine or imprisonment, or both under 18 USC Sec. 1001, and may jeopardize the validity of the subject patent application or any patent issuing thereon.

Dated: OCTOBER 9, 2007

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